IN THE CLAIMS

Please amend the claims as follows.

For the Examiner's convenience, a list of all claims is included below.

1.   (Currently Amended) A method comprising:

creating a data flow graph associated with a program;

identifying a first instruction that is to be executed after a second instruction;

determining that an outcome of the first instruction is dependent on an outcome of the second instruction based on the data flow graph, the outcome of the second instruction representing a key into a software structure that includes a set of keys representing various outcomes of the second instruction and a corresponding set of predicted outcomes of the first instruction; and

predicting the outcome of the first instruction, the predicting comprising inserting a third instruction to be executed after the second instruction and before the first instruction, wherein the third instruction is to retrieve a predicted outcome of the first instruction from the software structure based on using the outcome of the second instruction as the key into the software structure.

2.   (Original) The method of claim 1 wherein the second instruction precedes the first instruction during the execution of the program by one or more intermediate instructions.

3.   (Original) The method of claim 1 wherein the software structure is a lookup table.

4.   (Original) The method of claim 1 wherein each predicted outcome in the software structure is an outcome resulted from a last execution of the first instruction when an outcome of

the second instruction was equal to a key associated with said each predicted outcome in the software structure.

5.   (Original) The method of claim 4 further comprising:

inserting a fourth instruction to be executed after the first instruction, the fourth instruction is to update the software structure with the value resulted from the execution of the first instruction with the corresponding outcome of the second instruction.

6. .   (Original) The method of claim 1 wherein the first instruction is a branch instruction.

7.   (Original) The method of claim 6 wherein the branch instruction is any one of an indirect branch instruction and a direct branch instruction.

8.   (Original) The method of claim 6 wherein the outcome of the second instruction is a value that determines the outcome of the first instruction.

9.   (Original) The method of claim 6 wherein the outcome of the second instruction is a data address of a value that determines the outcome of the first instruction.

10.   (Original) The method of claim 1 wherein the first instruction is a linked list instruction.

11.   (Original) The method of claim 10 wherein:

each key in the software structure is a pointer to a producer item in a linked list; and

a predicted outcome corresponding to said each key in the software structure is a predicted pointer to a target item in the linked list;

wherein the producer item precedes the target item in the linked list by one or more intermediate items.

12. (Original) The method of claim 11 wherein:

the third instruction is to retrieve the predicted pointer of the target item from the software structure; and

the third instruction is to be executed in parallel with one or more instructions that obtain pointers to the one or more intermediate items.

13. (Original) The method of claim 10 wherein:

each key in the software structure is a value of a producer item in a linked list; and

a predicted outcome corresponding to said each key in the software structure is a predicted value of a target item in the linked list;

wherein the producer item precedes the target item in the linked list by at least one intermediate item.

14. (Currently Amended) An apparatus comprising:

a software structure to store a set of keys and a corresponding set of predicted outcomes of a target instruction; and

a compiler, coupled to the software structure, comprising:

a data flow graph creator to create a data flow graph associated with a program containing the target instruction that is to be executed after a producer instruction and to determine that an outcome of the target instruction is dependent on an outcome of the producer instruction based on the data flow graph, the outcome of the producer instruction representing a key into the software structure, wherein the software structure

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includes a set of keys representing various outcomes of the second instruction and a

corresponding set of predicted outcomes of the first instruction; and

a prediction optimizer to insert a first additional instruction to be executed after

the producer instruction and before the target instruction, wherein the first additional

instruction is to retrieve a predicted outcome of the target instruction from the software

structure ~~based on~~ using the outcome of the producer instruction as the key into the

software structure.

15.   (Original) The apparatus of claim 14 wherein the producer instruction precedes the target

instruction during the execution of the program by one or more intermediate instructions.

16.   (Original) The apparatus of claim 14 wherein the software structure is a lookup table.

17.   (Original) The apparatus of claim 14 wherein each predicted outcome in the software

structure is an outcome resulted from a last execution of the target instruction when an outcome

of the producer instruction was equal to a key associated with said each predicted outcome in the

software structure.

18.   (Original) The apparatus of claim 17 wherein the prediction optimizer is further to insert

a second additional instruction to be executed after the target instruction, the second additional

instruction is to update the software structure with the value resulted from the execution of the

target instruction with the corresponding outcome of the producer instruction.

19.   (Original) The apparatus of claim 14 wherein the target instruction is a branch

instruction.

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20. (Original) The apparatus of claim 14 wherein the target instruction is a linked list instruction.

21. (Currently Amended) A system comprising:

a compiler, coupled to the software structure, to create a data flow graph associated with a program containing a target instruction that is to be executed after a producer instruction, to determine that an outcome of the target instruction is dependent on an outcome of the producer instruction based on the data flow graph, the outcome of the producer instruction representing a key into a software structure storing a set of keys representing various outcomes of the second instruction and a corresponding set of predicted outcomes of the target instruction, and to predict the outcome of the first instruction by ~~insert~~ inserting a first additional instruction to be executed after the producer instruction and before the target instruction, wherein the first additional instruction is to retrieve a predicted outcome of the target instruction from the software structure ~~based on~~using the outcome of the producer instruction as the key into the software structure;

a memory to store the program, the software structure and the compiler; and

a processor, coupled to the memory, to execute the compiler.

22. (Original) The system of claim 21 wherein the producer instruction precedes the target instruction during the execution of the program by one or more intermediate instructions.

23. (Original) The system of claim 22 wherein each predicted outcome in the software structure is an outcome resulted from a last execution of the target instruction when an outcome of the producer instruction was equal to a key associated with said each predicted outcome in the software structure.

24.   (Original) The system of claim 23 wherein the prediction optimizer is further to insert a second additional instruction to be executed after the target instruction, the second additional instruction is to update the software structure with the value resulted from the execution of the target instruction with the corresponding outcome of the producer instruction.

25.   (Original) The system of claim 21 wherein the target instruction is a branch instruction.

26.   (Original) The system of claim 21 wherein the target instruction is a linked list instruction.

27.   (Currently Amended) A computer readable medium comprising executable instructions which when executed on a processing system cause said processing system to perform a method comprising:

creating a data flow graph associated with a program;

identifying a first instruction that is to be executed after a second instruction;

determining that an outcome of the first instruction is dependent on an outcome of the second instruction based on the data flow graph, the outcome of the second instruction representing a key into a software structure that includes a set of keys representing various outcomes of the second instruction and a corresponding set of predicted outcomes of the first instruction; and

predicting the outcome of the first instruction, the predicting comprising inserting a third instruction to be executed after the second instruction and before the first instruction, wherein the third instruction is to retrieve a predicted outcome of the first instruction from the software

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structure ~~based on~~ using the outcome of the second instruction as the key into the software structure.

28.   (Original) The computer readable medium of claim 27 wherein the second instruction precedes the first instruction during the execution of the program by one or more intermediate instructions.

29.   (Original) The computer readable medium of claim 27 wherein the first instruction is any one of a branch instruction and linked list instruction.